CLAIMS

What is claimed is:

1. A method for making a mode decision in video coding, comprising collecting a first portion of video data;

labeling the first portion of video data with an optimal mode;

identifying a feature of the first portion of video data corresponding to the optimal mode; and

making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video.

- 2. The method of claim 1, wherein collecting a first portion of video data includes collecting a sample of the video data.
- 3. The method of claim 1, wherein identifying a feature of the first portion of video data corresponding to the optimal mode includes:

defining at least one training feature vector and its cost relating to a unit of the first portion of video data;

defining a training feature space containing the feature vector; and partitioning the feature space.

4. The method of claim 3, wherein identifying a feature of the first portion of video data corresponding to the optimal mode further includes:

transforming the feature space; and constructing a probabilistic model of the feature space.

5. The method of claim 1, wherein making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video includes:

calculating a likelihood ratio for a unit of the second portion of the video using the value of the feature;

selecting a hypothesis for the unit that is believed to be true; and making the mode decision based on the selected hypothesis.

- 6. The method of claim 1, wherein the mode decision is selected from the group consisting of an intra-/inter-mode decision and a frame skip/code decision.
 - 7. A method of coding a sequence of video, comprising: extracting at least one sample unit of the video;

defining at least one training feature vector and an associated cost with the vector for the sample unit;

defining a training feature space associated with the feature vector;

transforming the feature space;
constructing a probabilistic model for the feature space;
calculating a likelihood ratio for a second unit of the video;
selecting a hypothesis that is believed to be true for the second unit of the video;
making a mode decision based on the selected hypothesis; and
coding the second unit of the video using the mode decision.

8. The method of claim 7, wherein the associated cost is associated with the mode decision.

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- 9. The method of claim 7, wherein the mode decision is selected from the group consisting of an intra-/inter-mode decision, a frame type selection decision, and a frame skip/code decision.
- 10. The method of claim 7, wherein defining a training feature space associated with the feature vector includes associating the training feature vector with a hypothesis that is true for the training feature vector.
- 11. The method of claim 7, wherein transforming the feature space includes replacing the training feature vector with a plurality of vectors having no height.
- 12. The method of claim 7, wherein constructing a probabilistic model for the feature space includes constructing a Gaussian model for the feature space using an expectation maximization algorithm.
- 13. The method of claim 7, wherein selecting a hypothesis that is believed to be true for the second unit of the video includes selecting a hypothesis for which a likelihood ratio associated with the second unit of the video exceeds a threshold.
- 14. The method of claim 7, wherein making a mode decision based on the selected hypothesis includes making a first mode decision when the selected hypothesis is true and making a second mode decision when another hypothesis is true.
 - 15. A video coding system, comprising:
 - a video encoder, the video encoder for:
 - collecting a first portion of video data;
 - labeling the first portion of video data with an optimal mode;
 - identifying a feature of the first portion of video data corresponding to the optimal mode; and

making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video; and a video decoder in communication with the video encoder.

16. A video encoder including a set of instructions which, when executed by the encoder, cause the encoder to:

collect a first portion of video data;

label the first portion of video data with an optimal mode;

identify a feature of the first portion of video data corresponding to the optimal mode; and

make a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video.

17. The encoder of claim 16, wherein the mode decision is selected from the group consisting of an intra-/inter-mode decision, a frame type selection decision, and a frame skip/code decision.

18. An apparatus, comprising:

means for collecting a first portion of video data;

means for labeling the first portion of video data with an optimal mode;

means for identifying a feature of the first portion of video data corresponding to the optimal mode; and

means for making a mode decision for a second portion of the video data based on a value of the feature in the second portion of the video.

19. An apparatus, comprising:

means for extracting at least one sample unit of a sequence of video;

means for defining at least one training feature vector and an associated cost with the vector for the sample unit;

means for defining a training feature space associated with the feature vector; means for transforming the feature space;

means for constructing a probabilistic model for the feature space;

means for calculating a likelihood ratio for a second unit of the video;

means for selecting a hypothesis that is believed to be true for the second unit of the video;

means for making a mode decision based on the selected hypothesis; and means for coding the second unit of the video using the mode decision.

20. A method of coding a sequence of video, comprising:

extracting at least one sample unit of the video;

defining at least one training feature vector and an associated cost with the vector for the sample unit;

defining a training feature space associated with the feature vector; transforming the feature space;

constructing a probabilistic model for the feature space;

partitioning the feature space into a plurality of regions;

selecting a hypothesis that is believed to be true for the second unit of the video;

making a mode decision based on the selected hypothesis; and

coding the second unit of the video using the mode decision.